UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,452	02/23/2004	Jeffrey J. Cernohous	55970US008	9990

32692 7590 06/06/2008

3M INNOVATIVE PROPERTIES COMPANY
PO BOX 33427
ST. PAUL, MN 55133-3427

EXAMINER	
EPPERSON, JON D	

ART UNIT	PAPER NUMBER
1639	

NOTIFICATION DATE	DELIVERY MODE
06/06/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LegalUSDocketing@mmm.com
LegalDocketing@mmm.com

Office Action Summary	Application No.	Applicant(s)	
	10/784,452	CERNOHOUS ET AL.	
	Examiner	Art Unit	
	Jon D. Epperson	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Application

1. The Response filed March 5, 2008 is acknowledged.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.

Status of the Claims

3. Claims 1-22 were pending. Applicants amended claim 1, 10, 20, and 22. No claim were added or canceled. Therefore, claims 1-22 are currently pending. Claims 21 is drawn to non-elected species and/or inventions and thus this claim remains withdrawn from further consideration by the examiner, 37 CFR 1.142(b), there being no allowable generic claim. Therefore, claims 1-20 and 22 are examined in this action.

Withdrawn Objections/Rejections

4. The 35 U.S.C. § 112, second paragraph rejection denoted "A" is withdrawn in view of Applicants' amendments to claims 1, 10, 20, and 22. All other rejections are maintained and the arguments are addressed below.

Outstanding Objections and/or Rejections

Claims Rejections - 35 U.S.C. 102

5. Claims 20 is rejected under 35 U.S.C. 102(b) as being anticipated by Neukermans (WO 97/22825) (Date of Patent is ***June 26, 1997***) (of record).

For ***claim 20***, Neukermans (see entire document) discloses a method for the synthesis of an array of polymers (e.g., see abstract; see also pages 20 and 21 which results in the synthesis of an array of DNA via PCR). Neukermans further discloses **(a)** providing an array of sealed flexible polymeric pouches (e.g., see figures 3 and 4 wherein the pouches are elements 124a, 124b, and 124c and/or 122; see also figure 11 wherein the pouches are elements 128 connected in series; see also page 21, first full paragraph; see also page 11, last paragraph wherein polyethylene/polyimide is disclosed as the material for making the pouch; see also page 14, last paragraph, pouch 108 is preferably made from … flexible … polymeric sheets; see also page 22, last paragraph disclosing thickness in the range of 0.001 inch; see also page 13, last paragraph; see also page 26, paragraph wherein a single sheet is used). Neukermans further discloses that each pouch attached to a conveyance apparatus (e.g., see figure 3 elements 158a, 158b, 158c or, alternatively, elements 128a, 128b, and 128c; elements 146 used in conjunction with elements 124a, 124b, and 124c may also be considered separately or together as part of the conveyance apparatus; see also page 16, paragraphs 1 and 2 wherein the peristalitic pump/syringe may be considered part of the conveyance apparatus). Neukermans also discloses that each pouch containing a same first reactant and a same second reactant (e.g., see figure 11; see also pages 21 and 22 wherein reagents for PCR are set forth for the two reaction chambers [i.e., pouches] shown in figure 11 corresponding to elements

198, which would include the DNA, heat stable polymerase, primers, etc. any of which would qualify as first/second reagents). Neukermans also discloses that at least a first pouch and a second pouch contains a similar volume ratio of first reactant to second reactant (e.g., see figure 11 wherein the contents of one chamber is shuttled back and forth to another second reaction chamber which would contain the same volume ratio of first reactant to second reactant before during and after the transport; see also page 21, last paragraph, especially, lines 26-30). Neukermans also discloses **(b)** conveying the array of sealed flexible polymeric pouches through a reaction zone exposing the first pouch to a first set of reaction conditions and exposing the second pouch to a second set of reaction conditions where the first set of reaction conditions are different than the second set of reaction conditions and cause the first reactant in each pouch to react with the second reactant in each pouch to produce an array of polymers (e.g., see figure 11; processing chambers 198; see also page 21, last paragraph, especially lines 26-27, "Temperature cycling can be accomplished by heating or cooling the processing chambers 198 [i.e., reaction zones], or, preferably, by periodically shuttling the liquid back and forth between the processing chambers 198 while maintaining the processing chambers 198 respectively at the two PCR temperatures [i.e., the chambers are kept at two different temperatures, or reaction conditions, and the liquid is cycled back and forth between the two]"). More specifically, as shown in figure 11, the pouches are "conveyed" from one location to another by the "compression" of the peristaltic pumps (shown as elements 202 in figure 11a) relative to the reaction chambers 196 (see also

paragraph bridging pages 21 and 22, "the piezoelectric transducers alternatively press the pistons 202 down first onto one of the processing chambers 198 and then onto the other processing chamber 198 [i.e., processing chambers 198 are "conveyed" from one place to another] … To enhance temperature uniformity while performing PCR, the pistons 202 may also be maintained at the temperatures T1 and T2 required for PCR"). Alternatively, page 19, first full paragraph discloses the "conveyance" of portable microfluidic systems into the appropriate reaction zones and their subsequent alignment via registration pins 106 (see also page 26). Finally, the method disclosed by Neukermans could be viewed as a "continuous" because the PCR reaction is "continually" performed via the requisite number of cycles to make the final product (e.g., see page 22, lines 8-9, "After performing the requisite number of cycles to complete PCR, the product thus obtained may be transferred through the capillary 126 to its ultimate destination").

Response

6. Applicants' arguments directed to the above 35 U.S.C. § 102 rejection were fully considered (and are incorporated in their entirety herein by reference) but were not deemed persuasive for the reasons set forth below. Please note that the above rejection has been modified from its original version to more clearly address applicants' arguments.

[1] Applicants argue, "Neukermans does not teach or suggest a continuous method for synthesizing an array of polymers" (e.g., see 3/5/08 Response, pages 7 and 8, especially page 8, second full paragraph).

[1] The Examiner respectfully disagrees. For example, the PCR reaction is continuously run until the final product is made (e.g., see page 22, lines 8-9, "After performing the requisite number of cycles to complete PCR, the product thus obtained may be transferred through the capillary 126 to its ultimate destination").

[2] Applicants argue, "The Examiner has asserted that Neukermans discloses providing an array of sealed flexible polymeric pouches in figures 3-4 where the pouches are elements 124a, 124b, and 124c and/or 122. however, Neukermans teaches a single substantially planar pouch as described on page 9 … Neukermans refers to elements 124a, 124b, and 124c as liquid filled reservoirs and element 122 as a reaction chamber" (e.g., see 3/5/08 response page 8, third full paragraph).

[2] Applicants define "pouch" as a flexible, self-supporting bag, package, or reaction vessel made of a film that preferably is inert to materials within it and impervious to fluids in the surrounding environment; preferably it is of unitary construction, although a combination of compatible materials can be used" (e.g., see specification, page 4, second to last paragraph). Thus, elements 124a, 124b, 124c and 122 all qualify as "pouches" within the meaning of this broad definition. For example, elements 124/122 are made of a flexible materials see also page

11, last paragraph wherein polyethylenelpolyimide is disclosed as the material for making the pouch; see also page 14, last paragraph, pouch 108 is preferably made from . . . flexible . . . polymeric sheets; see also page 22, last paragraph disclosing thickness in the range of 0.001 inch; see also page 13, last paragraph; see also page 26, paragraph wherein a single sheet is used). In addition, the pouches are "self-supporting" as the term is broadly used in Applicants' definition (e.g., see specification, page 5, lines 3 and 4, " 'self-supported pouches' means free-standing individually or as a plurality of pouches and not chemically attached to a support, although it can be transported by a conveyance"). Here, the array of pouches are free-standing as shown, for example, in figures 2 and 4. In addition, they are not chemically attached to the solid support. In addition, elements 124/122 permit the use of PCR reactions to take place and thus are made of materials that are impervious to fluids in the surrounding environment and inert to materials within it (e.g., see paragraph bridging pages 11 and 12, "The sheets 42 and 44 may consist of just about any polymer, preferably one that can be heat sealed. Even polyethylene pouches … have been successfully used. Preferred materials … are polyimide or Teflon coated polyimide due to such materials' inertness and mechanical properties"). Thus, elements 124/122 fall within Applicants' broad definition of a pouch.

[3] Applicants argue, "The Examiner has further asserted that the pouches are elements 128 connected in series between processing chamber 198 in figure 11" (e.g., see 3/5/08 response, bottom of page 8).

[3] It is respectfully submitted that this interpretation of the argument is wrong. The "pouches" are elements 198. These elements also constitute pouches for the same reasons set forth in [2] above.

[4] Applicants argue, "The Examiner has asserted that Neukermans discloses each pouch attached to a conveyance apparatus at Figure 3 and elements 158a, 158b, 15c or alternatively, elements 128a, 128b, and 128c … [However,] [t]he single substantially planar pouch 106 … is positioned on a base plate 102 and … [thus] is not attached to a conveying apparatus" (e.g., see 3/5/08 Response, page 9, paragraph 1).

[4] The Examiner respectfully disagrees. Step (a) of claim 20 reads, "providing an array of sealed flexible polymeric pouches, each pouch attached to a conveyance apparatus .. ." It does not read, "providing an array of sealed flexible polymeric pouches, each pouch attached to a conveyance apparatus that conveys the array of pouches … ." Thus, the claimed conveyance, at least for step (a), need not address the movement of pouches but, rather, could address the movement of any materials including water, PCR reactants and the like. Clearly, a peristaltic pump or the valve assemblies shown in the figures "convey" these types of materials from one place to another and Applicants admit as much when they state on the top of page 10 of the 3/5/08 response, "Neukermans describes liquids which are conveyed from more than one reservoir using external microfluidic valve(s) to control the flow of the liquids into the capillaries flowing into a reaction chamber."

[5] Applicants argue, "In the present invention, the first reactant and the second reactant of the first sealed flexible pouch are exposed to a first set of reaction conditions which are different than the second set of reaction conditions selected for the first reactant and the second reactant of the second sealed flexible pouch" (e.g., see 3/5/08 Response, page 9, paragraph 2).

[5] In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the first reactant and the second reactant of the first sealed flexible pouch are exposed to a first set of reaction conditions which are different than the second set of reaction conditions selected for the first reactant and the second reactant of the second sealed flexible pouch) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Here, the claim reads, "exposing the first pouch to a first set of reaction conditions and exposing the second pouch to a second set of reaction conditions," which is exactly what Neukermans discloses as set forth in the rejection above.

[6] Applicants argue, "Neukermans does not teach or suggest conveying an array of sealed flexible polymeric pouches through a reaction zone … Neukermans [does not describe] physically conveying or moving one pouch from a first location to a second location" (e.g., see 3/5/08 response, paragraph bridging pages 9 and 10).

[6] Claims are to be given their broadest reasonable interpretation consistent with Applicants' specification (e.g., see *In re Zletz*, 13 USPQ2d 1320, 1322 (Fed Cir. 1989) (holding

that claims must be interpreted as broadly as their terms reasonably allow); MPEP § 2111. Given this standard, the word "convey" is held here to mean simply moving something from one location to another. In the context of the claims, that would mean a physical movement of the pouches from one location to another with the caveat that the pouches move through a reaction zone. Here, figure 11a clearly depicts movement of the pouches (via elements 202) through reaction zones T1 and T2. This is further supported by the accompanying text which reads in pertinent part, "the piezoelectric transducers alternatively press the pistons 202 down first onto one of the processing chambers 198 and then onto the other processing chamber 198 … To enhance temperature uniformity while performing PCR, the pistons 202 may also be maintained at the temperatures T1 and T2 required for PCR" (e.g., see paragraph bridging pages 21 and 22). Thus, reaction chambers 198 are conveyed (i.e., moved from one place to another) through the reaction zones (i.e., reaction zones T1 and T2 formed from the pistons, which may be heated/cooled, and the heating/cooling elements 196). Alternatively, the pouches are also "conveyed" when they are placed into the apparatus and aligned with heating/cooling elements via the registration pins (e.g., see page 19, first full paragraph disclosing the conveyance of portable microfluidic systems that re subsequently aligned via the registration pins 106 to insure that the pouches pass into the appropriate reaction zones; see also page 26).

Accordingly, the 35 U.S.C. § 102 rejection cited above is hereby maintained.

Claim Rejections - 35 USC § 103

7. Claims 1-20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Neukermans (WO 97/22825) (Date of Patent is ***June 26, 1997***) (of record) in view of McPherson et al. (PCR. M. J. McPherson and S. G. Møller. BIOS Scientific Publishers, Oxford. **2000**, pages 9-21 and 67-87) (of record).

For ***claim 1***, Neukermans discloses a method for the synthesis of an array of polymers (e.g., see abstract; see also pages 20 and 21 which results in the synthesis of an array of DNA via PCR). Neukermans et al. further disclose **(a)** providing an array of sealed flexible polymeric pouches (e.g., see figures 3 and 4 wherein the pouches are elements 124a, 124b, and 124c and/or 122; see also figure 11 wherein the pouches are elements 128 connected in series; see also page 21, first full paragraph; see also page 11, last paragraph wherein polyethylene/polyimide is disclosed as the material for making the pouch; see also page 14, last paragraph, pouch 108 is preferably made from … flexible … polymeric sheets; see also page 22, last paragraph disclosing thickness in the range of 0.001 inch; see also page 13, last paragraph; see also page 26, paragraph wherein a single sheet is used). Furthermore, Neukermans et al. disclose that each pouch attached to a conveyance apparatus (e.g., see figure 3 elements 158a, 158b, 158c or, alternatively, elements 128a, 128b, and 128c; elements 146 used in conjunction with elements 124a, 124b, and 124c may also be considered separately or together as part of the conveyance apparatus; see also figures 1 and 2 wherein element 24 may be considered part of the conveyance apparatus; see also page 16, paragraphs 1 and 2 wherein the peristalitic pump/syringe may be considered part of the conveyance apparatus). Neukermans also discloses that each pouch contains a first reactant and a same second reactant (e.g., see

figure 11; see also pages 21 and 22 wherein reagents for PCR are set forth for the two reaction chambers shown in figure 11, which would include the DNA, heat stable polymerase, primers, etc. any of which would qualify as first/second reagents). Neukermans also discloses **(b)** conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first reactant in each pouch to react with the second reactant in each pouch to produce an array of polymers (e.g., see figure 11; processing chambers 198; see also page 21, last paragraph, especially lines 26-27, "Temperature cycling can be accomplished by heating or cooling the processing chambers 198 [i.e., reaction zones], or, preferably, by periodically shuttling the liquid back and forth between the processing chambers 198 while maintaining the processing chambers 198 respectively at the two PCR temperatures"). More specifically, as shown in figure 11, the pouches are "conveyed" from one location to another by the "compression" of the peristaltic pumps (shown as elements 202 in figure 11a) relative to the reaction chambers 196 (see also paragraph bridging pages 21 and 22, "the piezoelectric transducers alternatively press the pistons 202 down first onto one of the processing chambers 198 and then onto the other processing chamber 198 [i.e., processing chambers 198 are "conveyed" from one place to another] … To enhance temperature uniformity while performing PCR, the pistons 202 may also be maintained at the temperatures T1 and T2 required for PCR"). Alternatively, page 19, first full paragraph discloses the "conveyance" of portable microfluidic systems into the appropriate reaction zones and their subsequent alignment via registration pins 106 (see also page 26). Finally, the method disclosed by Neukermans could be viewed as

a "continuous" because the PCR reaction is "continually" performed via the requisite number of cycles to make the final product (e.g., see page 22, lines 8-9, "After performing the requisite number of cycles to complete PCR, the product thus obtained may be transferred through the capillary 126 to its ultimate destination").

For ***claim 2***, Neukermans discloses the method according to claim 1 wherein the providing step further comprises providing an array of pouches that are linearly joined (e.g., see figure 11; elements 196/198 are linearly joined; see also figure 5 and discussion related thereto).

For ***claim 3***, Neukermans discloses the method according to claim 1 wherein the providing step further comprises providing an array of pouches that are linearly and horizontally joined (e.g., see figure 3-5 and 11 showing both linear and horizontal arrangements).

For ***claim 4-6***, Neukermans discloses the method according to claim 1 conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first reactant in each pouch to react with the second reactant in each pouch to produce an array of 90 different polymers (e.g., see page 19, first full paragraph disclosing the conveyance of portable microfluidic systems that are subsequently aligned via the registration pins 106 to insure that the pouches pass into the appropriate reaction zones; see also page 26). Neukermans do not state that 90 different polymers are produced but the Examiner contends that this would be an inherent feature of the PCR process as an enormous number of copies of the DNA are produced during the course of the synthesis including

from 1 to 1,048,576 copies by the 20th cycle (e.g., see McPherson et al., page 12, Table 2.1), which would include 10, 30 and 90 along the way.

For ***claim 7***, Neukermans discloses the method according to claim 1 further comprising the step of labeling each pouch (e.g., see figures 3-5 wherein the pouches are labeled with element numbers).

For ***claim 9***, Neukermans discloses the method according to claim 1 further comprising the step of analyzing the polymer in each sealed flexible polymeric pouch by a non-destructive technique (e.g., see figure 12; see also page 23, paragraph 1 wherein non-destructive fluorescence analysis is disclosed; see also page 23, paragraph 2 wherein TIR is disclosed; see also figure 15 wherein CE is disclosed).

For ***claim 10***, Neukermans further discloses, in addition to the limitations set forth above for claim 1, the use of a captive pouch. For instance, element 108 may be viewed as "large" pouch in figure while elements 124a, 124b, 124c, 122, etc may be viewed as the "captive" pouches. Furthermore, the duplication of the large pouches to process multiple samples in parallel would be immediately envisioned. See, for example, *In re Harza*, (274 F.2d 669, 124 USPQ 378 (CCPA 1960)) where the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced.

For ***claim 11***, Neukermans discloses the method according to claim 10 wherein the step of providing comprises providing a captive pouch containing a portion of the same first reactant or a portion of the same second reactant (e.g., see figure 11 wherein

the liquid is shuttled back and forth and, as a result, each pouch contains a "portion" of the reagents at any one given time; see also page 21, last paragraph).

For ***claim 12***, Neukermans discloses the method according to claim 10 wherein the step of providing comprises providing a captive pouch containing a third reactant that is different than the first or second reactant (e.g., see figure 3 showing pouches for three different reactants; see also figure 5 showing pouches for 4 different reactants corresponding to elements 124a-d).

For ***claim 13***, Neukermans discloses the method according to claim 10 further comprising the step of rupturing the captive pouch and releasing material within the captive pouch into the each sealed flexible polymeric pouch (e.g., see figure 7 wherien the rupturing occurs by applying an electric voltage to the piezoelectric element thereby rupturing the seal between elements 114 and 116).

For ***claim 14***, Neukermans discloses the method according to claim 13 wherein the rupturing step precedes the exposing step (e.g., see figure 3 wherein the rupturing that occurs during the piezoelectric valve switch precedes a heat exposure to element 122 via element 152).

For ***claim 15***, Neukermans discloses the method according to claim 13 wherein the rupturing step follows the exposing step (e.g., see figure 11 wherein the processing chambers are exposed to heat, etc. and then ruptured via another piezoelectric valve; see also figure 10 and corresponding text wherein many different configurations are disclosed).

For ***claim 16***, Neukermans discloses the method according to claim 15 further comprising the step of exposing the ruptured pouches to a controlled environment to cause the material within the captive pouch to react with the polymer in each sealed polymeric pouch (e.g., see figure 11 wherein the pouches are exposed to a controlled environment such as conditions amenable to PCR; see also page 21, last two paragraphs).

For ***claim 17***, Neukermans discloses the method according to claim 10 wherein the step of providing comprises providing a captive pouch attached to each sealed flexible polymeric pouch (e.g., see figure 3 wherein the pouch 108 contains a captive pouch such as 124, 128 or 122; see also figure 5 showing captive pouches 124a-d). Please note that merely "duplicating" the number of pouches (i.e., element 108), which contain various captive pouches, to process more than one sample in parallel is not inventive. See, for example, *In re Harza*, (274 F.2d 669, 124 USPQ 378 (CCPA 1960)) where the court held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced.

For ***claim 18***, Neukermans discloses the method according to claim 10 wherein the step of providing comprises providing a captive pouch free floating within each sealed flexible polymeric pouch (e.g., see page 15, first full paragraph, especially lines 15-16, "Entire areas of the sheets 114 and 116 may be laminated, or laminations may be formed only partially to outline the patterns [i.e., freely floating with respect to the parts that are not laminated]"; see also page 17, last paragraph, "It is not necessary to laminate together the entire areas outside of the reservoirs … Laminating the peripheries of these

areas is sufficient").

For ***claim 19***, Neukermans discloses the method according to claim 10 wherein the step of providing comprises providing more than one captive pouch within each sealed flexible polymeric pouch (e.g., see figures 3 and 5 disclosing more than one captive pouch).

For ***claim 20***, Neukermans anticipates the claimed invention (see 35 U.S.C. § 102(b) rejection above, which is incorporated in its entirety herein by reference) and, as a result, also renders this claim obvious. *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983) ("anticipation is the epitome of obviousness"); see also *In re Skoner*, 517 F.2d 947, 950, 186 USPQ 80, 83 (CCPA 1975); *In re Pearson*, 494 F.2d 1399, 1402, 181 USPQ 641, 644 (CCPA 1974).

For ***claim 22***, Neukermans discloses in addition to the limitations set forth in claim 1, the use of a first and second reactant polymer (e.g., the primers or the template DNA strand) and also the use of a mixing chamber (e.g., see figure 11 wherein the liquid is shuttled back and forth or "tapped" periodically with a piston (e.g., see figure 11; see also page 22, paragraphs 1 and 2).

The prior art teachings of Neukermans differs from the claimed invention as follows:

For ***claims 1 and 8***, Neukermans fails to teach different volume ratio of first/ second reactants. Neukermans is silent on this point only mentioning that PCR is performed via thermocycling in the array of pouches disclosed therein.

However, McPherson et al. teach the following limitations that are deficient in Neukermans:

For ***claims 1 and 8***, McPherson et al. (see chapters 2 and 4) teach the use of PCR and optimization protocols related thereto. Specifically, McPherson et al. teach the use of adding different amounts/volumes of template, primer, reaction additives and enzyme to optimize PCR reactions that don't produce any product or, alternatively, produce too many products indiscriminately (e.g., see chapter 2 for general PCR setup and background; see chapter 4 for optimization, especially section 2.3, 2.10, 3 and table 4.1 disclosing various optimization protocols wherein the amount of one or more reagent is varied; see also section 2.3 with regard to setting up multiple samples (i.e., a titration) in parallel to test various amounts of a reagent).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use different volumes/amounts of PCR reagents as taught by McPherson et al. in the PCR method/apparatus as taught by Neukermans because McPherson et al. explicitly states that PCR methods often require optimization. Furthermore, a person of ordinary skill in the art would have been motivated to use the optimization conditions set forth in McPherson et al. to obtain the desired quantity of DNA product in cases where the "standard" conditions were not sufficient. In addition, a person of skill in the art would have been motivated to test more than one sample in parallel to increase the speed by which a large number of optimization conditions could be tested in a given period of time. A person of skill in the art would reasonably have

expected to be successful because PCR is a widely used, routine technique employing "text book" optimization protocols (e.g., see McPherson et al., Table 4.1).

Response

8. Applicants' arguments directed to the above 35 U.S.C. § 103(a) rejection were fully considered (and are incorporated in their entirety herein by reference) but were not deemed persuasive for the reasons set forth below. Please note that the above rejection has been modified from its original version to more clearly address applicants' arguments.

[1] Applicants argue, "Neukermans does not describe or suggest a continuous method comprising an array of sealed flexible polymeric pouches each attached to a conveyance apparatus. Neukermans does not disclose each pouch having a same first reactant and a same second reactant such that at least one pouch of the array of sealed of sealed flexible polymeric pouches contains a different volume ratio of first reactant to second reactant. Neukermans does not describe or suggest conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first reactant in each pouch to react with the second reactant in each sealed flexible polymeric pouch to produce an array of polymers" (e.g., see 3/5/08 response, pages 10 and 11, especially page 11, last paragraph).

[1] In response to applicant's arguments against the Neukermans reference individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA

1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Here, the combined references of Neukermans and McPherson et al. teach all of the claimed limitations as set forth in the rejection above.

[2] Applicants argue, "Neukermans does not describe or suggest a continuous method comprising an array of sealed flexible polymeric pouches each attached to a conveyance apparatus. Neukermans does not disclose each sealed flexible polymeric pouch having a same first reactant ad a same second reactant such that at least one sealed flexible polymeric pouch of the array of sealed flexible polymeric pouches contains a different volume ratio of first reactant to second reactant, and each sealed flexible polymeric pouch contains a captive pouch. Neukermans does not describe or suggest conveying the array of sealed flexible pouches through a reaction zone to cause the first reactant in each sealed flexible polymeric pouch to react with the second reactant in each sealed flexible polymeric pouch to produce an array of polymers" (e.g., see 3/5/08 response, page 12, first full paragraph).

[2] See response [1] above.

[3] Applicants argue, "In regards to claim 20, Neukermans does not describe or suggest a continuous method comprising an array of sealed flexible polymeric pouches each attached to a conveyance apparatus. Neukermans does not disclose each sealed flexible polymeric pouch having a same first reactant and a same second reactant such that at least one sealed flexible polymeric pouch of the array of sealed flexible polymeric pouches contains a similar volume ratio of the first reactant to the second reactant, Neukermans does not describe or suggest

conveying the array of sealed flexible polymeric pouches through a reaction zone exposing the first sealed flexible pouch to a first set of reaction conditions and exposing the second sealed flexible polymeric pouch to a second set of reaction conditions such that the first set of reaction conditions are different than the second set of reaction conditions, and causing the first reactant in each sealed flexible polymeric pouch to react with the second reactant in each sealed flexible polymeric pouch to produce an array of polymers." (e.g., see 3/5/08 response, page 12, second full paragraph).

[3] See response [1] above.

[4] Applicants argue, "In regards to claim 22, Neukermans does not describe or suggest a continuous method comprising an array of sealed flexible polymeric pouches each attached to a conveyance apparatus. Neukermans does not disclose each sealed flexible polymeric pouch having a same first polymer and a same second polymer such that at least one sealed flexible polymeric pouch contains a similar volume ratio of first polymer to second polymer. Neukermans does not describe or suggest conveying the array of sealed flexible polymeric pouches through a reaction zone to cause the first polymer in each sealed flexible polymeric pouch to interact with the second polymer in each sealed flexible polymeric pouch to produce an array of polymer mixtures." (e.g., see 3/5/08 response, paragraph bridging pages 12 and 13).

[4] See response [1] above.

[5] Applicants argue, "With respect to claims 1, 10, 20 and 22 of the present invention, McPherson doesn't teach or suggest a continuous method for synthesizing an array of polymers or polymer mixtures in individually sealed flexible polymeric pouches connected to a conveyance apparatus such that each of the sealed flexible polymeric pouches is conveyed through a reaction zone" (e.g., see 3/5/08 response, page 13, first full paragraph).

[5] In response to applicant's arguments against the McPherson reference individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Here, the combined references of Neukermans and McPherson et al. teach all of the claimed limitations as set forth in the rejection above.

Accordingly, the 35 U.S.C. § 103(a) rejection cited above is hereby maintained.

Conclusion

Applicant's amendment necessitated any new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon D Epperson whose telephone number is (571) 272-0808. The examiner can normally be reached Monday-Friday from 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James (Doug) Schultz can be reached on (571) 272-0763. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jon D. Epperson/
Primary Examiner, AU 1639